

Room sensor / Room operating unit CO₂ /
Humidity / Temperature

For measuring temperature, humidity and CO₂ in the room and for regulating the room temperature and/or ventilation. Thanks to MP-Bus communication and integrated analogue outputs, the room units can be seamlessly connected to existing third-party controllers. Commissioning and configuration of the device are conveniently done with Belimo Assistant 2. The end user can access the device via the Belimo Display App to read room values and to adjust setpoints.



Picture may differ from product



MP-BUS



Type Overview

Type	Communication	I/O	Measured values	Setpoint	Accuracy temperature
22RTM-18-1	MP-Bus	3x AO	CO ₂ , Temperature, Relative humidity, Dew point	Temperature, Volumetric flow	±0.3°C @ 25°C [±0.5°F @ 77°F]
22RTH-18-1	MP-Bus	3x AO	Temperature, Relative humidity, Dew point	Temperature, Volumetric flow	±0.3°C @ 25°C [±0.5°F @ 77°F]
22RT-18-1	MP-Bus	3x AO	Temperature	Temperature, Volumetric flow	±0.3°C @ 25°C [±0.5°F @ 77°F]

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage range	AC 19.2...28.8 V / DC 19.2...28.8 V
	Power consumption AC	max. 1 VA (V output) max. 4 VA (mA output)
	Power consumption DC	max. 0.5 W (V output) max. 2 W (mA output)
	Electrical connection	Spring loaded terminal 0.2...2.5 mm ²
	Electrical connection note	Cable type USA and Canada: CL2 or higher
	Cable entry	Back side Top side Bottom side
Data bus communication	Communication	MP-Bus
	Number of nodes	MP-Bus max. 8 (16)
Functional data	Medium	Air
	Input/Output	3x analogue output: 0...10 V (factory setting), 0...5 V, 2...10 V or 4...20 mA, selectable with Belimo Assistant 2
	Input/Output Note	V output: min. resistance 5 kΩ mA output: max. resistance 500 Ω
	Display	Belimo Display App The LED is used for the CO ₂ TLF (traffic light function). The LED can be configured and deactivated via Belimo Assistant 2. (Type (P-)22RTM-..).

Technical data

Measuring data	Measured values	CO ₂ Relative humidity Dew point Temperature
Specification CO₂	Sensing element technology	Non-dispersive infrared (NDIR) dual channel
	Measuring range	Default setting: 0...2000 ppm
	Accuracy	±(50 ppm + 2% of measured value)
	Long term stability	±20 ppm p.a.
Specification temperature active	Measuring range	0...50°C [32...122°F] (default setting)
	Long term stability	±0.03°C p.a. @ 25°C [±0.05°F p.a. @ 77°F]
Specification Humidity	Measuring range	Default setting: 0...100% RH
	Measuring range dew point	Default setting: -50...50°C [-60...120°F]
	Accuracy	±2% between 0...90% RH @ 25°C
	Long term stability	±0.25% RH p.a. @ 25°C @ 50% RH
Safety data	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP30
	EU Conformity	CE Marking
	Quality Standard	ISO 9001
	UL Approval	cULus according to UL60730-1, CAN/CSA E60730-1
	Type of action	Type 1
	Rated impulse voltage supply	0.5 kV
	Pollution degree	2
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	0...50°C [32...122°F]
	Storage temperature	-40...70°C [-40...160°F]
Materials	Housing	PC, white, RAL 9003 UL94V-0

Safety notes


This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application. Unauthorised modifications are prohibited. The product must not be used in relation with any equipment that in case of a failure may threaten humans, animals or assets.

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Cal Green Code	The devices *22RTM* comply with the requirements outlined in the Cal Green Code (Section 5.506.3), which mandates carbon dioxide monitoring in classrooms. This ensures that educational environments adhere to state regulations for air quality, promoting a healthier and safer atmosphere for both students and staff.
-----------------------	--

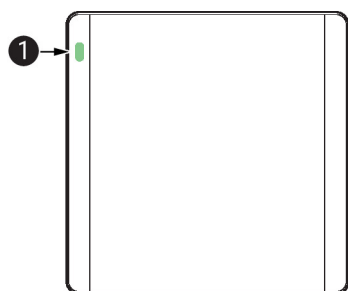
Product features

- Dynamic temperature compensation** Active temperature sensors with electronic components always have a thermal dissipation that influences the temperature measurement. The dissipative heat correlates with the level of the applied supply voltage and the levels of the analogue outputs.
- Belimo room temperature sensors have adaptive temperature compensation, which reliably compensates for the device's self-heating for all permissible supply voltages and output levels. This ensures that the room temperature is recorded with maximum accuracy at all times.
- CO₂ dual channel technology** All CO₂ sensors are subject to drift, which is caused by the ageing process of the components and requires regular calibration and adjustment or replacement of the sensors. The dual-channel technology minimises this drift by compensating for the majority of the ageing effects of the measuring channel through adjustment with a reference channel.
- This makes it possible to use dual-channel sensors in applications with 24/7 occupancy. Regular calibration with fresh outdoor air, as is the case with sensors with ABC logic, is not necessary with dual-channel sensors. It is recommended to recalibrate the sensor after 5 years of operation.

Remarks

- General remarks concerning sensors** The measuring result is influenced by the thermal characteristics of the wall. A solid concrete wall responds to thermal fluctuations within a room more slowly than a light-weight structure wall. A room sensor always detects a mixture of air and wall temperature. This means that the radiant heat of the wall, which is important for comfort, is also included in the measurement result.
- Remark: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.**
- Application notice for humidity sensors** The humidity sensor is extremely sensitive. Touching the sensor element or exposing it to aggressive substances like chlorine, ozone, ammonia, hydrogen peroxide or ethanol (i.e. as a cleaning agent) may affect the measurement accuracy.
- Long-term operation outside the recommended conditions (5...50°C and 20...80% RH) can result in a temporary offset. After returning to the recommended range, this effect will disappear.

Indicators



- 1** CO₂ TLF (traffic light function), available on the (P-)22RTM-.. sensor

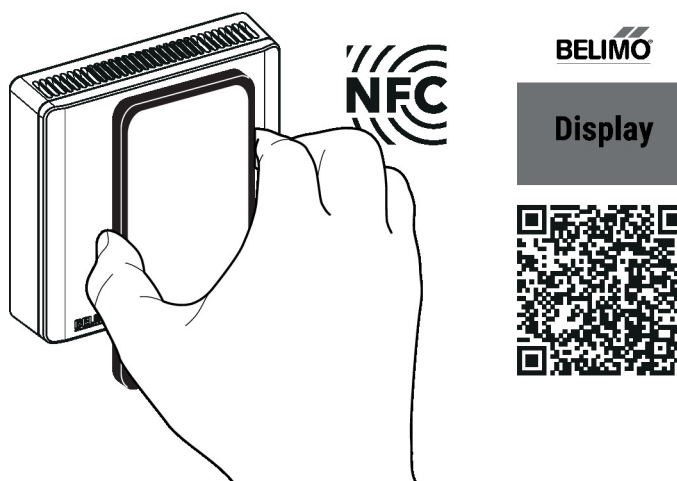
Colours: green, yellow and red. LED can be configured and deactivated via Belimo Assistant 2.

Operation

Operation With the Belimo Display App, actual values of the room unit can be displayed and setpoints can be adjusted. This means that no display on the room unit is required. Thanks to communication via NFC (near field communication), third parties cannot access safety critical data.

How it works:

1. Download the Belimo Display App
2. Hold the smartphone to the room unit
3. View/adjust actual values or setpoints
4. To activate the setpoints, hold the smartphone to the room unit again



Parts included

Screws

Accessories

Tools	Description	Type
	Service tool for wired and wireless setup, on-site operation and troubleshooting.	Belimo Assistant 2
	Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices	LINK.10
	Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal	ZK2-GEN

Service

Using Belimo Assistant 2, device parameters can be modified. Belimo Assistant 2 can operate on a smartphone, tablet or PC. The available connection options vary depending on the hardware on which Belimo Assistant 2 is installed.

For more information about Belimo Assistant 2, refer to the Quick Guide – Belimo Assistant 2.



Service

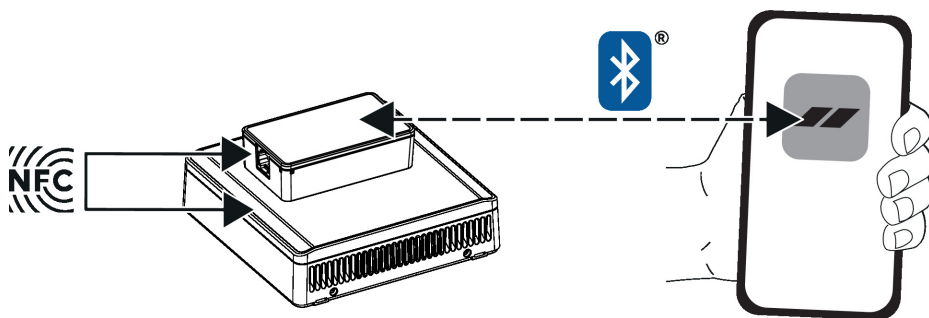
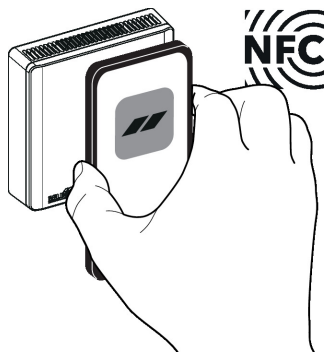
Wireless connection Belimo devices marked with the NFC logo can be operated with Belimo Assistant 2.

Requirement:

- NFC- or Bluetooth-capable smartphone
- Belimo Assistant 2 (Google Play and Apple App Store)

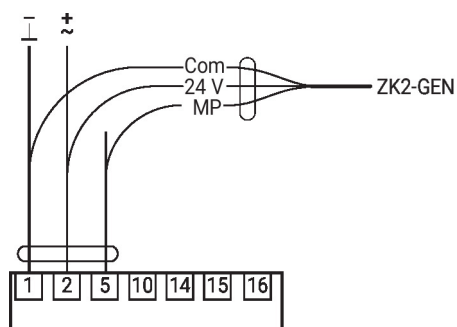
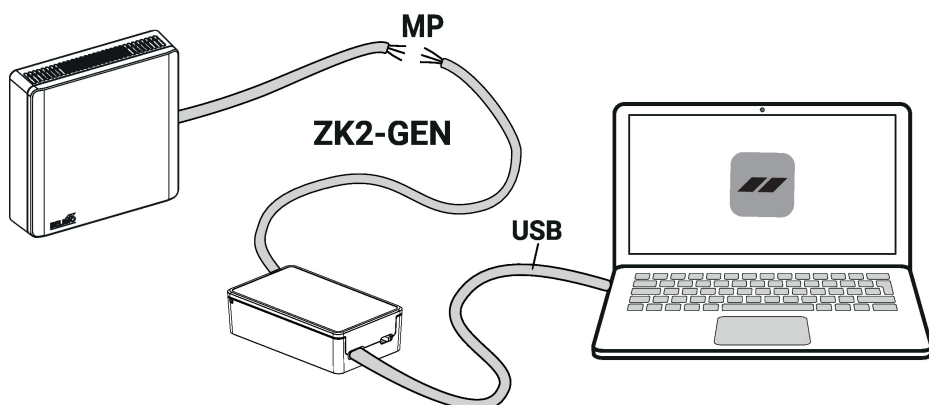
Align NFC-capable smartphone on the device so that both NFC antennas are superposed.

Readable values: volumetric flow, accumulated flow, fluid temperature, glycol content in %, alarm/error messages



Wired connection Belimo devices can be accessed by connecting Belimo Assistant Link to the USB port on a PC or laptop and to the service socket or MP-Bus wire on the device.

Belimo Assistant 2 acts as MP client. Therefore, no other MP client shall be connected to the device.



Wiring diagram

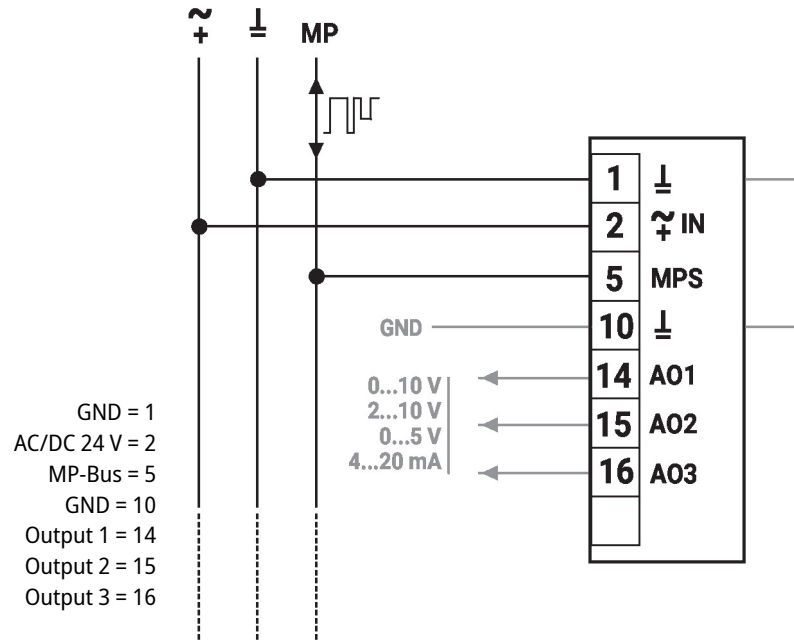

Analogue outputs: The analogue outputs AO1, AO2 and AO3 can be configured via NFC.

Factory settings:

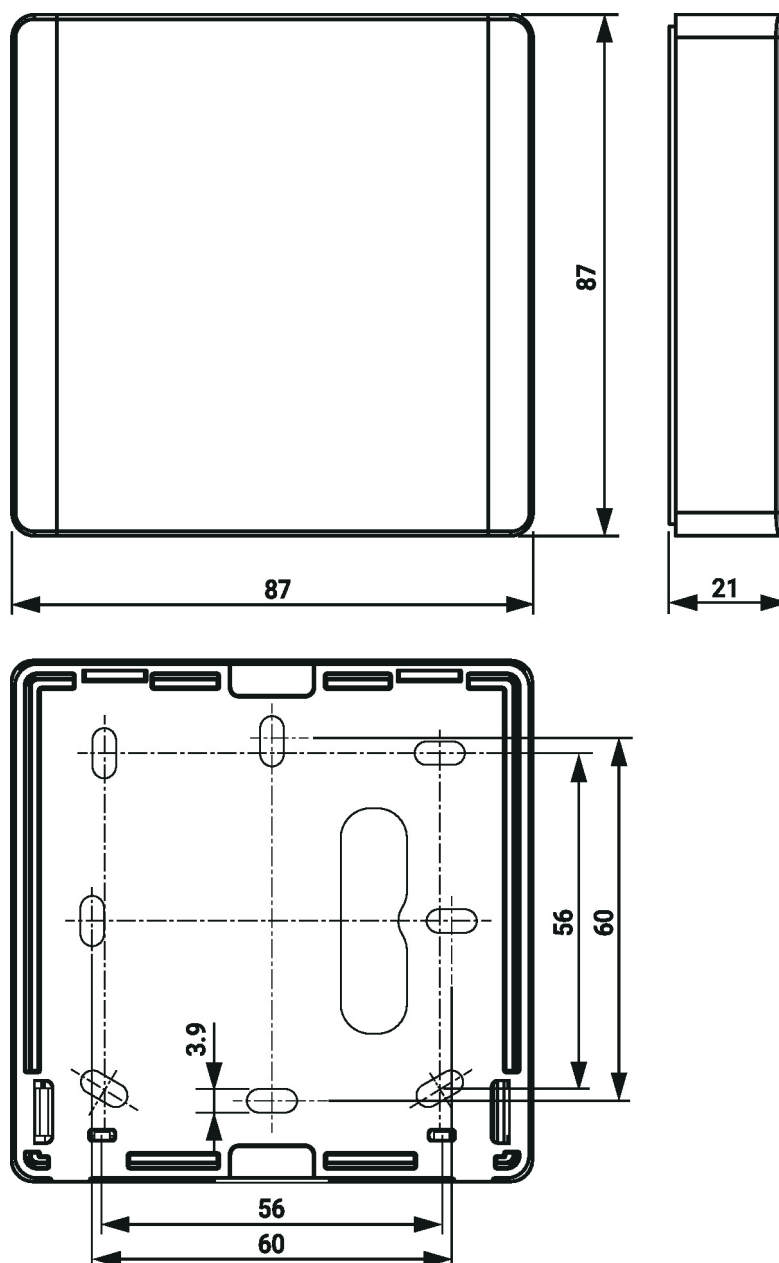
AO1: Temperature

AO2: Humidity

AO3: CO₂



Dimensions



Type	Weight
22RTM-18-1	0.16 kg
22RTH-18-1	0.090 kg
22RT-18-1	0.090 kg

Further documentation

- Overview MP Cooperation Partners
- Description Data-Pool Values
- Installation instructions
- Quick Guide – Belimo Assistant 2